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U.S. PATENT & TRADEMARK OFFICE

BRIEF FOR APPELLANT

IN RE LAVAUGHN F. WATTS, JR.

United States Court of Appeals

For the Federal Circuit

03-1121

(Serial no. 08/568,904)

IN RE LAVAUGHN F. WATTS, JR.

APPEAL FROM A DECISION OF THE BOARD OF PATENT APPEALS AND INTERFERENCES DATED AUGUST 30, 2002

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CERTIFICATE OF INTEREST

Pursuant to Rule 47.4 of this Court, counsel for Appellants furnish the following list:

(1) The full names of every party represented by the attorneys in the case are:

LaVaughn F. Watts, Jr.

(2) The name of the real party in interest is: Texas Instruments Incorporated.

(3) The names of all law firms whose partners or associates that have appeared for the party in the lower tribunal or are expected to appear for the party in this Court are:

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STATUTES

STATEMENT OF RELATED CASES

Pursuant to Rule 47.5 of this Court, counsel for Appellant states: (1) no other appeal in or from the same civil action or proceeding in the lower court or body was previously before this or any other appellate court under the same or similar title; and (2) no cases are known to counsel to be pending in this or any other court that will directly affect or be directly affected by this Court's decision in the pending appeal.

STATEMENT OF JURISDICTION

Pursuant to Rule 47.6 of this Court, counsel for Appellants state that the jurisdiction of this Court is based:

(a) on 35 U.S.C. 134, the statutory basis of Appellant's appeal to the Board of Patent Appeals and Interferences;

(b) on 35 U.S.C. 141 to 144, the statutory basis of Appellant's appeal to this Court; and

(c) on 35 U.S.C. 142 and 37 CFR 1.301, 1.302 and 1.304 in accordance with which a timely notice of appeal was filed and served.

STATEMENT OF THE ISSUES

The sole legal issue before the Court is whether the U.S. Patent and Trademark Office (hereinafter PTO or "Patent Office") Board of Patent Appeals and Interferences (hereinafter "the Board") erred in holding the

invention, as defined in Claims 2, 3, 5, 6, 9, 17-21, 23, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103? The subissues are:

1) Did the PTO establish a prima facie case of obviousness of Claims 5, 6, 9 and 21, and through claim dependency, Claims 2, 3, 30, 31, 34-39, 41-43, 45-47, 49-51, 51, 53-55, 57-59, 61-63, 65-67 and 71-73, over Hollowell in view of Kikinis and Gephardt under 35 U.S.C. § 103, as required by law?

A. Is there suggestion or motivation, either in the Hollowell, Kikinis and Gephardt references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the respective references or to combine reference teachings?

B. Is there reasonable expectation that the combination of Hollowell, Kikinis and Gephardt will result in an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O?

C. Do the Hollowell, Kikinis and Gephardt references teach all of the limitations of independent Claims 5, 6 and 9?

2) Did the PTO establish a prima facie case of obviousness of Claims 17, 18 and 21, and through claim dependency, Claims 19, 20 and 23, over Hollowell in view of Kikinis and Chen under 35 U.S.C. § 103(a), as required by law?

A. Did the Board specifically determine that in the proposed combination, Hollowell and Kikinis's *actual* temperature measurements were REPLACED with Chen's *predicted* temperature?

B. Is the Chen reference relevant to Claim 21 and was it erroneously relied upon by the Board (in combination with Hollowell and Kikinis) to obviate Claim 21?

STATEMENT OF THE CASE AND THE FACTS

1. Procedural History

This is an ex parte appeal from the Board of Patent Appeals and Interferences (hereinafter the Board) Decision on Appeal dated August 30, 2002 (A1-A13) in the application of LaVaughn F. Watts, Jr., Serial Number 08/568,904 filed December 7, 1995.

Patent application 08/568,904 filed December 7, 1995, is a Continuation-in-Part application of the prior application Serial No. 08/023,831, filed on 02/23/93, which is a Continuation of application Serial No. 07/429,270, filed 10/30/89.

The Examiner issued his first Office Action on February 21, 1997 (A95-A111): Claims 30 and 31 were rejected under 35 U.S.C. § 112, second paragraph; Claims 4, 7 and 10 were provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of claims in copending application Serial No. 08/572,202; and Claims 1-11, and 13-29 were rejected under 35 U.S.C. § 103 as being unpatentable over Hollowell et al. in view of

Watts, Jr. et al. Appellant filed an Amendment (A112-A123) to the Office Action on June 25, 1997, amending many of the existing claims, canceling Claims 4, 7, 8, 10, 12, 22 and adding new Claims 32-74.

The Examiner issued his second (Final) Office Action on October 16, 1997 (A134-A145): Claims 36, 40, 44, 48, 52, 56, 60, 64, 68, and 74 were objected to as being dependent on canceled Claim 10; Claims 1-3, 5-6, 9, 11, 32-35, 37-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67, and 71-73 were rejected under 35 U.S.C. § 103 as being unpatentable over Hollowell, II et al. in view of Kikinis; Claims 13-16 were rejected under 35 U.S.C. § 103 as being unpatentable over Hollowell, II et al in view of Kikinis further in view of Smith et al.; Claims 17-21, 23-29, and 69-70 were rejected under 35 U.S.C. § 103 as being unpatentable over Hollowell, II et al in view of Kikinis and further in view of Kenny et al.; and Claims 30 and 31 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hollowell, II et al in view of Kikinis and further in view of Gephardt et al.

Appellant filed an Amendment under 37 CFR § 1.116 (A146-A159) to the Office Action on December 17, 1997, amending many of the existing claims, canceling Claims 1, 13-16, 24-29, 32, 33 and 74. In an Advisory

Action on January 21, 1998, (A160-A161) the Examiner refused to enter Appellant's Amendment of December 17, 1997, on the grounds that the amendment raises at least one issue that would require further consideration.

Appellant filed a Continued Prosecution Application (CPA) on January 28, 1998 (A162-A163). Appellant further filed a Preliminary Amendment with the CPA on January 28, 1998 (A164-A175), amending many of the existing claims, canceling Claims 1, 11, 13-16, 24-29, 32, 33, 40, 44, 48, 52, 56 and 74.

The Examiner issued his third Office Action on April 28, 1998 (A177-A187): Claim 9 was objected to under 35 U.S.C. § 112, second paragraph; Claims 60, 64 and 68 were objected to under 37 CFR § 1.75; Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67, and 71-73 were rejected under 35 U.S.C. § 103 as being unpatentable over Hollowell, II et al. in view of Kikinis and further in view of Gephardt et al; Claims 17-21, 23 and 69-70 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hollowell, II et al in view of Kikinis further in view of Chen et al.

Appellant filed an Amendment (A188-A201) to the Office Action on July 28, 1998, amending Claims 9, 17, 18 and canceling Claims 60, 64, and 68-70. The Examiner issued a fourth Office Action (Final) on October 14, 1998, (A202-A213): Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67, and 71-73 were rejected under 35 U.S.C. § 103 as being unpatentable over Hollowell, II et al. in view of Kikinis and further in view of Gephardt et al; Claims 17-21 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hollowell, II et al in view of Kikinis further in view of Chen et al.

Appellant filed a Notice of Appeal on December 29, 1998 (A214) and his Appeal Brief to the Board on March 25, 1999 (A215-A242). The Examiner filed his Examiner's Answer on April 26, 1999 (A245-A255). Appellant filed a Reply Brief on June 22, 1999 (A256-A262). On July 2, 1999, the Examiner issued an Office Communication (A263-A265) in which the Examiner refused to enter Appellant's Reply Brief. Appellant filed a Petition to Require Examiner to Enter Reply Brief on September 16, 1999 (A266-A273) requesting that the Reply Brief be entered. On October 1, 1999, the Examiner issued an Office Communication (A275-A277) stating that the Reply Brief would be entered.

The Board issued its Decision on Appeal on August 30, 2002 (A1-A13), affirming the rejection of Claims 2, 3, 5, 6, 9, 17-21, 23, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73. Appellant filed his Notice and Reasons of Appeal from U.S.P.T.O. Appeal No. 2000-0434 with this Court on October 24, 2002.

2. Summary of the Invention

A real-time thermal management apparatus is provided which determines whether a CPU may rest based upon real-time sampling of temperature levels within the apparatus. In one embodiment of the invention, the apparatus has a provision for user input; a provision for an output; a central processing unit (CPU) coupled to the user input and output; a monitor for monitoring temperature within the apparatus; and a clock manager selectively stopping clock signals from being sent to the central processing unit (CPU) when the monitored temperature rises to a level at and above a selected reference temperature level *and* the CPU is not processing critical I/O.

In another embodiment of the invention, an apparatus is provided having a provision for user input; a provision for an output; a central processing unit (CPU) coupled to the user input and output, the central processing unit (CPU) receiving one of a first clock signal at a first speed or a second clock signal at a second speed; and a clock manager coupled to a monitor that monitors temperature within the apparatus, the clock manager designating that the central processing unit (CPU) receives the first clock signal when the monitored temperature is at a level below a selected reference temperature level and receives the second clock signal when the detected temperature is at a level at and above the selected reference temperature level *and* the CPU is not processing critical I/O.

In yet another embodiment of the invention, the apparatus has a provision for user input; a provision for an output; a central processing unit (CPU) coupled to the user input and output; a monitor for monitoring temperature within the apparatus; and a clock manager adapted to receive a control signal from the monitor, the clock manager reducing central processing unit (CPU) clock speed when a detected temperature level is at and above a selected reference temperature level *and* the CPU is not processing critical I/O.

In still another embodiment of the invention, a computer has a means for sampling a temperature level associated with the operation of a central processing unit within the computer; means for predicting temperature levels associated with the operation of a central processing unit within the computer; and means for using the prediction for automatic control of temperature within the computer, the temperature control remaining transparent to a user of the computer.

In still yet another embodiment of the invention, a computer has means for sampling a temperature level associated with the operation of the computer; means for predicting temperature levels associated with the operation of the computer; and means for using said prediction for automatic temperature control within the computer, the temperature control remaining transparent to a user of the computer.

In yet still another embodiment of the invention, an apparatus has a central processing unit (CPU); means for sampling a temperature level within the apparatus; and means for automatically adjusting the processing speed of the central processing unit (CPU) by modifying the clock signal utilized by the central processing unit (CPU) to maintain the temperature

level within the apparatus below a selected reference temperature level when the CPU is not processing critical I/O.

3. The Claims

The following claims are under appeal:

2. The apparatus of Claim 5, wherein said user input is coupled to a keyboard.

3. The apparatus of Claim 5, wherein said output is coupled to a display device.

5. An apparatus, comprising:

a provision for user input;

a provision for output;

a central processing unit (CPU) coupled to said user input and output;

a monitor for monitoring temperature within said apparatus; and

a clock manager adapted to receive a control signal from said monitor,

said clock manager selectively stopping clock signals from being sent to said central processing unit (CPU) when said monitored temperature rises to a level at and above a selected reference temperature level and said CPU is not processing critical I/O.

6. An apparatus, comprising:

a provision for user input;

a provision for output;

a central processing unit (CPU) coupled to said user input and output, said central processing unit (CPU) receiving one of a first clock signal at a first speed or a second clock signal at a second speed; and

a clock manager coupled to a monitor that monitors temperature within said apparatus, said clock manager designating that said central processing unit (CPU) receives said first clock signal when said monitored temperature is at a level below a selected reference temperature level and receives said second clock signal when said detected temperature is at a level at and above said selected reference temperature level and said CPU is not processing critical I/O.

9. An apparatus, comprising:

a provision for user input;

a provision for output;

a central processing unit (CPU) coupled to said user input and output;

a monitor for monitoring temperature within said apparatus; and

a clock manager adapted to receive a control signal from said monitor, said clock manager reducing central processing unit (CPU) clock speed when a detected temperature level is at and above a selected reference temperature level and said CPU is not processing critical I/O.

17. A computer, comprising:

means for sampling a temperature level associated with the operation of a central processing unit within said computer;

means for predicting temperature levels associated with the operation of a central processing unit within said computer; and

means for using said prediction for automatic control of temperature within said computer, said temperature control remaining transparent to a user of said computer.

18. A computer, comprising:

means for sampling a temperature level associated with the operation

of said computer;

means for predicting temperature levels associated with the operation of said computer; and

means for using said prediction for automatic temperature control within said computer, said temperature control remaining transparent to a user of said computer.

19. The computer of Claim 17, including means for user modification of said temperature level predictions.

20. The computer of Claim 18, including means for user modification of said temperature level predictions.

21. An apparatus, comprising:

a central processing unit (CPU);

means for sampling a temperature level within said apparatus; and

means for automatically adjusting the processing speed of said central processing unit (CPU) by modifying the clock signal utilized by the central processing unit (CPU) to maintain said temperature level within said apparatus below a selected reference temperature level when said CPU is not

processing critical I/O.

23. The apparatus of Claim 21, wherein said adjustments are accomplished within the central processing unit (CPU) cycles and do not affect the user's perception of performance.

30. The apparatus of Claim 5 wherein said clock manager further stops clock signals from being sent to a PCI bus coupled to the central processing unit (CPU).

31. The apparatus of Claim 30 wherein said clock manager further stops clock signals from being sent to any other CPUs connected to the PCI bus.

34. The apparatus of Claim 5, wherein said monitor is on board said central processing unit (CPU).

35. The apparatus of Claim 9, wherein said monitor is on board said central processing unit (CPU).

36. The apparatus of Claim 6, wherein said monitor is on board said central processing unit (CPU).

37. The apparatus of Claim 6, wherein said monitored temperature is detected via a temperature sensor coupled to said central processing unit (CPU).

38. The apparatus of Claim 5, wherein said monitored temperature is detected via a temperature sensor coupled to said central processing unit (CPU).

39. The apparatus of Claims 9, wherein said monitored temperature is detected via a temperature sensor coupled to said central processing unit (CPU).

41. The apparatus of Claim 37, wherein said temperature sensor is mounted directly on said central processing unit (CPU).

42. The apparatus of Claim 38, wherein said temperature sensor is mounted directly on said central processing unit (CPU).

43. The apparatus of Claim 39, wherein said temperature sensor is mounted directly on said central processing unit (CPU).

45. The apparatus of Claim 37, wherein said temperature sensor is mounted within said central processing unit (CPU).

46. The apparatus of Claim 38, wherein said temperature sensor is mounted within said central processing unit (CPU).

47. The apparatus of Claim 39, wherein said temperature sensor is mounted within said central processing unit (CPU).

49. The apparatus of Claim 37, wherein said temperature sensor is mounted on a printed wiring board (PWB) adjacent said central processing unit (CPU).

50. The apparatus of Claim 38, wherein said temperature sensor is mounted on a printed wiring board (PWB) adjacent said central processing unit (CPU).

51. The apparatus of Claim 39, wherein said temperature sensor is mounted on a printed wiring board (PWB) adjacent said central processing unit (CPU).

53. The apparatus of Claim 37, wherein said temperature sensor is a thermistor.

54. The apparatus of Claim 38, wherein said temperature sensor is a thermistor.

55. The apparatus of Claim 39, wherein said temperature sensor is a thermistor.

57. The apparatus of Claim 6, wherein said temperature is sensed on a periodic basis.

58. The apparatus of Claim 5, wherein said temperature is sensed on a periodic basis.

59. The apparatus of Claim 9, wherein said temperature is sensed on a periodic basis.

61. The apparatus of Claim 57, wherein the frequency of said temperature sensing changes as said temperature reaches preselected threshold values.

62. The apparatus of Claim 58, wherein the frequency of said temperature sensing changes as said temperature reaches preselected threshold values.

63. The apparatus of Claim 59, wherein the frequency of said temperature sensing changes as said temperature reaches preselected threshold values.

65. The apparatus of Claim 57, wherein the frequency of said temperature sensing is user modifiable.

66. The apparatus of Claim 58, wherein the frequency of said temperature sensing is user modifiable.

67. The apparatus of Claim 59, wherein the frequency of said temperature sensing is user modifiable.

71. The apparatus of Claim 6, wherein said monitor uses a control system of continuous feedback loops.

72. The apparatus of Claim 5, wherein said monitor uses a control system of continuous feedback loops.

73. The apparatus of Claim 9, wherein said monitor uses a control system of continuous feedback loops.

SUMMARY OF THE ARGUMENT

The Board erred in holding the invention, as defined in Claims 2, 3, 5, 6, 9, 17-21, 23, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73, would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103. The sub arguments are:

1) The PTO did not establish a prima facie case of obviousness of Claims 5, 6, 9 and 21, and through claim dependency, Claims 2, 3, 30, 31, 34-39, 41-43, 45-47, 49-51, 51, 53-55, 57-59, 61-63, 65-67 and 71-73, over Hollowell in view of Kikinis and Gephardt under 35 U.S.C. § 103, as required by law.

A. There is no suggestion or motivation, either in the Hollowell, Kikinis and Gephardt references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the respective references or to combine reference teachings. The Board and Examiner failed: 1) to cite any teaching in Hollowell, or provide any evidence of knowledge available to one having ordinary skill in the art, that suggests Hollowell's technique of stopping power to the CPU to reduce heat build up is deficient or inadequate, or that it can, or should be, combined with another technique (such as reducing clock frequency) for reducing power consumption; or 2) to cite any teaching in Kikinis, or provide any evidence of knowledge available to one having ordinary skill in the art, that suggests Kikinis' technique of adjusting the frequency of the clock signals supplied to components to reduce heat build up is deficient or inadequate, or that it can, or should be, combined with another technique (such as stopping

power to the CPU) for reducing power consumption; or 3) to cite any teaching in Gephardt or provide any evidence of knowledge available to one having ordinary skill in the art that suggests Gephardt's technique of using detected activities in making power management decisions, which is not concerned at all with temperature, is deficient or inadequate, or that it can, or should be, combined with other power saving technique designed to reduce heat build up. The Examiner combined the three references and held Claims 5, 6 and 9 obvious over the resulting combination.

Accordingly, the motivation for combination provided by the PTO is a conclusion improperly based on the Examiner's (and Board's) own understanding or experience. Case law requires the Examiner (and Board) to point to some concrete evidence in the record to support their findings.

B. There is no reasonable expectation that the combination of Hollowell, Kikinis and Gephardt will result in an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O. First, the Board does not explain how one having ordinary skill in the art would cut out the power control techniques

in Hollowell and substitute therefor Kikinis's frequency control without undue experimentation. Second, Gephardt does not teach or suggest the identification of critical I/O activity. Gephardt simply discloses power control apparatus that classifies activity into two categories: "primary" and "secondary". Both types of activity are processed at full clock speed. Neither of these activities is slowed or stopped while being processed.

Indeed, the only significant difference between the two types of activity is in how long it takes to return to the previous state after the activity is finished processing. Since Gephardt fails to teach or suggest reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing "primary" activity (which the Board equates to Appellant's critical I/O), the combination of Hollowell, Kikinis and Gephardt will not result in an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O, as required by Claims 5, 6 and 9.

C. The Hollowell, Kikinis and Gephardt references do not teach all of the limitations of independent Claims 5, 6 and 9. The Board (and

Examiner) determined that Hollowell and Kikinis teach all of the elements, except thermal control **by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O**. The Board relies upon Gephardt for this teaching. The Board, however, improperly determined that Gephardt cannot shut down the computer while primary (critical) I/O activities are taking place, but CAN shut down the computer while secondary (non-critical) I/O activities are taking place. Such determination by the Board is clearly erroneous since Gephardt teaches that it processes BOTH "primary activities" and "secondary activities" at the maximum clock frequency. The only distinction between "primary activities" and "secondary activities" in Gephardt is how fast the system returns to doze, standby, or suspend, after the respective activity is over. Accordingly, the combination of Hollowell, Kikinis and Gephardt fails to teach all of the elements of Claim 5, 6 and 9.

2) The PTO did not establish a prima facie case of obviousness of Claims 17, 18 and 21, and through claim dependency, Claims 19, 20 and 23, over Hollowell in view of Kikinis and Chen under 35 U.S.C. § 103(a), as required by law.

A. The Board specifically determined that in the proposed combination, Hollowell and Kikinis's actual temperature measurements were REPLACED with Chen's predicted temperature. Accordingly, the combination of Hollowell, Kikinis and Chen would have no actual temperature measuring (sampling) capability as is required by Claims 17, 18 and 21.

B. The Chen reference is not relevant to Claim 21 and was erroneously relied upon by the Board (in combination with Hollowell and Kikinis) to obviate Claim 21. The Board (and Examiner) determined that Hollowell and Kikinis teach all of the elements, except thermal control **by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O**. The Board (and Examiner) relies upon Gephardt for this teaching. The Board, however, improperly determined that Gephardt cannot shut down the computer while primary (critical) I/O activities are taking place, but CAN shut down the computer while secondary (non-critical) I/O activities are taking place. Such determination by the Board is clearly erroneous since Gephardt teaches that it processes BOTH "primary activities" and "secondary activities" at the maximum clock frequency. The only distinction between "primary activities" and "secondary activities" in

Gephardt is how fast the system returns to doze, standby, or suspend, after the respective activity is over.

Since Gephardt fails to teach "**reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O**", as determined by the Board, the resulting combination of Hollowell, Kikinis and Gephardt similarly fails to teach all of the elements of Claim 21.

ARGUMENT

1) The PTO did not establish a prima facie case of obviousness of Claims 5, 6, 9 and 21, and through claim dependency, Claims 2, 3, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73, over Hollowell in view of Kikinis and Gephardt under 35 U.S.C. § 103, as required by law.

In proceedings before the Patent and Trademark Office, "the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art". In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (citing In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). "The Examiner can satisfy this burden only by showing

some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references", In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992)(citing In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)(citing In re Lalu, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)).

Even if the cited art were to disclose components of the device in issue, case law holds that it is insufficient that the prior art discloses the components of the device in issue, either separately or used in another combination; there must be some teaching, suggestion, or incentive to make the combination made by the inventor. Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934, 15 USPQ2d 1321, 1323 (Fed. Cir. 1990). Moreover, "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined ONLY if there is some suggestion or incentive to do so." ACS Hosp. Systems, Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Laskowski, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

To establish a prima facie case of obviousness, three basic criteria must be met. **First**, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a reasonable expectation of success. **Finally**, the prior art reference (or references when combined) must teach or suggest ALL the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Board's affirmance of the Examiner's determination of obviousness of the above-identified claims is erroneous for the following reasons:

A. There is no suggestion or motivation, either in the Hollowell, Kikinis and Gephardt references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the respective references or to combine reference teachings.

The Hollowell reference teaches:

> A method and apparatus for providing thermal management to a computer system where the internal temperature is measured and, **based on the temperature, heat generated in the computer system is reduced by turning off a portion of the system**. When the portion of the system is off, no power is consumed by that portion. Accordingly, no heat is generated as well. In this manner, the heat generated in the computer system is reduced (A278, ABSTRACT, lines 1-8).

Accordingly, Hollowell teaches that heat can be a problem for computer systems and teaches reducing heat by turning power off to components within the system – NOT by reducing clock frequency.

The Kikinis reference, on the other hand, teaches:

> A system for controlling temperature buildup in an IC that employs a temperature sensor to provide an indication of the IC temperature to a control circuit **which is configured to provide an operation clock rate to the IC which is less than the**

system clock, based on a function of the temperature of the IC or its package (A294, ABSTRACT, lines 1-6).

Kikinis reduces heat by reducing clock rate to the IC – but does not turn off power to the IC.

The Gephardt reference teaches a power management architecture that is concerned with power management only from a perspective of conserving energy – NOT temperature problems. Gephardt teaches:

> An integrated processor is provided that includes a CPU core coupled to a variety of on-chip peripheral devices such as a DMA controller, an interrupt controller, a timer. The integrated processor further includes a power management message unit coupled to the DMA controller, interrupt controller, and timer for monitoring the internal interrupt and bus request signal of the integrated processor. The power management message unit may also monitor other selected activities of the integrated processor such as activities of a floating-point coprocessing subunit. Based on the detected activities, if any, the power management message unit encodes a message on a power management message bus to thereby provide information regarding the internal events of the integrated processor to an external power management unit. The **power management unit receives the encoded messages on the power management message bus and responsively makes decision as to the appropriate power management mode to enter** (A305, ABSTRACT, lines 1-16).

Regardless of the fact that the Examiner failed: 1) to cite any teaching in Hollowell, or provide any evidence of knowledge available to one having

ordinary skill in the art, that suggests Hollowell's technique of stopping power to the CPU to reduce heat build up is deficient or inadequate, or that it can, or should be, combined with another technique (such as reducing clock frequency) for reducing power consumption; or 2) cite any teaching in Kikinis, or provide any evidence of knowledge available to one having ordinary skill in the art, that suggests Kikinis' technique of adjusting the frequency of the clock signals supplied to components to reduce heat build up is deficient or inadequate, or that it can, or should be, combined with another technique (such as stopping power to the CPU) for reducing power consumption; or 3) cite any teaching in Gephardt or provide any evidence of knowledge available to one having ordinary skill in the art that suggests Gephardt's technique of using detected activities in making power management decisions, which is not concerned at all with temperature, is deficient or inadequate, or that it can, or should be, combined with other power saving technique designed to reduce heat build up, the Examiner combined the three references and held Claims 5, 6 and 9 obvious over the resulting combination.

More particularly, the Examiner found that "it would have been obvious to the artisan to maintain thermal control in Hollowell by adjusting

the frequency of clock signals as taught by Kikinis (A6, lines 2-5). Further, the Examiner found that "the combination of Hollowell and Kikinis meets the claimed invention except for the claimed feature of not stopping the clock signal when the CPU is processing critical I/O" (A6, lines 5-8). Regarding the missing feature, the Examiner found that "it would have been obvious to the artisan to stop the clock of the Hollowell-Kikinis combination only when the CPU is not processing critical I/O to prevent losing vital information (A6, lines 11-14). To support this determination, the Examiner found that, "the disclosure in Gephardt of primary and secondary activities teaches the detection of a "critical activity"" (A7, lines 3-5). Similarly, the Examiner states that "Gephardt was cited only to show that there are critical activities during which power to the computer cannot be stopped" (A7, lines 7-9).

> The Board, in affirming the rejection, set forth the following reasons:
>
> We will sustain the examiner's rejection with respect to independent claims 5, 6 and 9. We first note that we agree with the propriety of the examiner's combination of the applied prior art. Hollowell and Kikinis both relate to the control of heat generation within a computer in order to maintain the temperature within a desirable operating range. These two references also teach that heat control can be achieved by either power control or clock frequency control. We agree with the examiner that it would have been obvious to the artisan to replace the power control of Hollowell with the frequency control of Kikinis to maintain the temperature of the computer

within the desirable operating range (A7, line 12 – page 8, line 2).

> We also agree with the examiner that the designation of activities in Gephardt as primary activities and secondary activities discloses that some activities are considered to be more critical than other activities. The primary activities of Gephardt clearly correspond to the critical activity of the claimed invention. Gephardt discloses that primary activities cause the computer to enter the ready state regardless of its current state [column 3, lines 22-24]. Therefore, the computer cannot be shut down when a primary activity is occurring. Gephardt also discloses that the primary activities include the various I/O activities such as parallel port activities, serial port activities, floppy disk activities and hard disk activities [column 9, lines 27-31]. Therefore, Gephardt teaches that a computer should not be shut down while these primary (critical) I/O activities are taking place. We agree with the examiner that it would have been obvious to the artisan to modify the Hollowell-Kikinis combination to take into account the critical I/O activities which are taking place as taught by Gephardt (A8, lines 3-20).

Appellant respectfully points out that nowhere did the Board or Examiner identify any teaching within the Hollowell, Kikinis and Gephardt references OR identify any objective teaching in the prior art, that would lead one of ordinary skill in the art to combine Hollowell, Kikinis and Gephardt. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also Interconnect Planning Corp. v.

Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985). Moreover, the CAFC has stated that "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

Indeed, with respect to the core factual finding regarding Claims 5, 6 and 9, and through claim dependency, Claims 2, 3, 30, 31, 34-39, 41-43, 45-47, 49-51, 51, 53-55, 57-59, 61-63, 65-67 and 71-73, the Board cannot, as it has done in the present case, simply reach a conclusion based on its own understanding or experience – or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings. To hold otherwise would render the process of appellate review for substantial evidence on the record a meaningless exercise. Baltimore & Ohio R.R. v. Anderdeen & Rockfish R.R. Co., 393 U.S. 87, 91-92, 21 L. Ed. 2d 219, 89 S.Ct. 280 (1968)(rejecting a determination of the Interstate Commerce Commission with no support in the record, noting that if the Court were to conclude otherwise, "the requirement for administrative decisions based on substantial evidence and reasoned finding – which alone make effective judicial review possible – would become

lost in the haze of so-called expertise). Accordingly, the Board's affirmance of Claims 5, 6 and 9, and through claim dependency, Claims 2, 3, 30, 31, 34-39, 41-43, 45-47, 49-51, 51, 53-55, 57-59, 61-63, 65-67 and 71-73, under 35 U.S.C. § 103 as being unpatentable over Hollowell in view of Kikinis and Gephardt is erroneous and should be reversed.

A. There is no reasonable expectation that the combination of Hollowell, Kikinis and Gephardt will result in an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O.

The PTO has provided no evidence whatsoever that Hollowell, Kikinis and Gephardt can be combined by one having ordinary skill in the art to produce an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O, as taught by Claims 5, 6 and 9. More particularly, the Board determined the following:

> We agree with the examiner that it would have been obvious to the artisan **to replace the power control of Hollowell with the frequency control of Kikinis** to maintain the temperature of the computer within the desirable operating range (A7, line 19 – page 8, line 2).

The Board does not explain how one having ordinary skill in the art would cut out the power control techniques in Hollowell and substitute therefore Kikinis's frequency control without undue experimentation. Next, the PTO adds the teaching of Gephardt to the combination of Hollowell and Kikinis to produce an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O, as taught by Claims 5, 6 and 9. Appellant respectfully responds that Gephardt does not teach what is argued by the Board, which, when further combined with the teaching of Hollowell and Kikinis. More particularly, the Board determined:

> We also agree with the examiner that the designation of activities in Gephardt as primary activities and secondary activities disclose **that some activities are considered to be more critical than other activities.** The **primary activities of Gephardt clearly correspond to the critical activity of the claimed invention.** Gephardt discloses that primary activities cause the computer to enter the ready state regardless of its current state [column 3, lines 22-24]. Therefore, the computer cannot be shut down when a primary activity is occurring. Gephardt also discloses that the primary activities include the various I/O activities such as parallel port activities, serial port activities, floppy disk activities and hard disk activities [column 9, lines 27-31]. Therefore, **Gephardt teaches that a computer should not be shut down while these primary (critical) I/O activities are taking place.** We agree with the examiner that it would have been obvious to the artisan to modify the Hollowell-Kikinis

combination to take into account the critical I/O activities which are taking place as taught by Gephardt (A8, lines 3-20).

Appellant respectfully responds that Gephardt does not teach or suggest the identification of critical I/O activity. Nowhere in Gephardt is there even an iota of an indication or suggestion that the primary activity has any greater criticality than does the secondary activity or is to be treated in any manner different from the secondary activity except as noted herein in "C". Indeed, (and which is more fully explained in Appellant's response in "C" below) while Gephardt does classify activity into two groups (i.e., "primary" and "secondary"), the identification is not related to "I/O" or to the "criticality" of the activity. Gephardt specifically points out that "primary activity" is processed at full clock speed (A316, col. 7, lines 49-56). Gephardt similarly points out that "secondary activity" is processed at full clock speed (A316, col. 8, lines 40-52). The only significant difference in the way Gephardt treats "primary" and "secondary" activity is in the amount of time the system takes to return to doze state 602 or stand-by state 604. In the case of "primary" activity, the system must repeat the various waiting cycles (A316, col. 7, line 61 – col. 8, line 28), whereas in the case of "secondary" activity, the system returns to the previous state following a predetermined amount of time (e.g., it does not have to repeat the various waiting cycles).

Accordingly, Gephardt fails to teach that some activity in its primary activities and secondary activities are considered to be more critical than other activities, as determined by the Board (A8, lines 3-6). Similarly, Gephardt fails to teach or suggest that its "primary activities" correspond to the critical activity of the claimed invention, as determined by the Board (A8, lines 6-8). Finally, there is no teaching in Gephardt that would suggest that the clock to a CPU can be stopped while processing "secondary" activity, whereas the clock to a CPU cannot be stopped while processing "primary" activity. As a result, there is no reasonable expectation that the combination of Hollowell, Kikinis and Gephardt will result in an apparatus that maintains thermal control by reducing or slowing a clock signal to a CPU ONLY when the CPU is not processing critical I/O.

B. <u>The Hollowell, Kikinis and Gephardt references do not teach all of the limitations of independent Claims 5, 6 and 9</u>.

Independent Claim 5 requires and positively recites, "a provision for user input", "a provision for output", "a central processing unit (CPU) coupled to said user input and output", "a monitor for monitoring

temperature within said apparatus", and "a clock manager adapted to receive a control signal from said monitor, said clock manager selectively stopping clock signals from being sent to said central processing unit (CPU) when said monitored temperature rises to a level at and above a selected reference temperature level **and said CPU is not processing critical I/O**".

Independent Claim 6, as amended, requires and positively recites, "a provision for user input", "a provision for output", "a central processing unit (CPU) coupled to said user input and output, said central processing unit (CPU) receiving one of a first clock signal at a first speed or a second clock signal at a second speed" and "a clock manager coupled to a monitor that monitors temperature within said apparatus, said clock manager designating that said central processing unit (CPU) receives said first clock signal when said monitored temperature is at a level below a selected reference temperature level and receives said second clock signal when said detected temperature is at a level at and above said selected reference temperature level **and said CPU is not processing critical I/O.**"

Independent Claim 9, as amended, requires and positively recites, "a provision for user input", "a provision for output", "a central processing unit

(CPU) coupled to said user input and output", "a monitor for monitoring temperature within said apparatus" and "a clock manager adapted to receive a control signal from said monitor, said clock manager reducing central processing unit (CPU) clock speed when said detected temperature level is at and above a selected reference temperature level **and said CPU is not processing critical I/O**".

The Board, in affirming the rejection, stated the following:

> We will sustain the examiner's rejection with respect to independent claims 5, 6 and 9. We first note that we agree with the propriety of the examiner's combination of the applied prior art. Hollowell and Kikinis both relate to the control of heat generation within a computer in order to maintain the temperature within a desirable operating range. These two references also teach that heat control can be achieved by either power control or clock frequency control. We agree with the examiner that it would have been obvious to the artisan to replace the power control of Hollowell with the frequency control of Kikinis to maintain the temperature of the computer within the desirable operating range (A7, line 12 – page 8, line 2).
>
> We also agree with the examiner that the designation of activities in Gephardt as primary activities and secondary activities discloses that some activities are considered to be more critical than other activities. **The primary activities of Gephardt clearly correspond to the critical activity of the claimed invention**. Gephardt discloses that primary activities cause the computer to enter the ready state regardless of its current state [column 3, lines 22-24]. Therefore, **the computer cannot be shut down when a primary activity is occurring.** Gephardt also discloses that the primary activities include the

> various I/O activities such as parallel port activities, serial port activities, floppy disk activities and hard disk activities [column 9, lines 27-31]. Therefore, **Gephardt teaches that a computer should not be shut down while these primary (critical) I/O activities are taking place**. We agree with the examiner that it would have been obvious to the artisan to modify the Hollowell-Kikinis combination to take into account the critical I/O activities which are taking place as taught by Gephardt (A8, lines 3-20).

The Board thus determined Gephardt's "primary activities" = Appellant's "critical I/O". It is logical to conclude that the Board thereafter determined Gephardt's "secondary activities" = Appellants "all remaining activity, including non-critical I/O". According to the Board's rationale, Gephardt's computer cannot be shut down during a critical activity, but it can be shut down during a "secondary activity". Appellant respectfully points out that a careful reading of Gephardt shows that the Board has completely misunderstood and misapplied the teaching of Gephardt in the present case, as set forth below:

First, Gephardt does not equate its designation of "primary activities" as being "critical". Indeed, Gephardt simply divides activity into two categories: a) primary, and b) secondary. Appellant agrees that many of the activities in the "primary" category are I/O activities. Nevertheless, Gephardt does not categorize them as being "critical".

Second, the Board improperly determined that Gephardt cannot shut down the computer while primary (critical) I/O activities are taking place, but it can shut down the computer while secondary (non-critical) I/O activities are taking place. Such determination by the Board is clearly erroneous since Gephardt teaches that it processes BOTH "primary activities" and "secondary activities" at the maximum clock frequency. The only distinction between "primary activities" and "secondary activities" in Gephardt is how fast the system returns to doze, standby, or suspend, after the respective activity is over. More particularly, Gephardt teaches:

> Specifically, power management state machine 260 includes a ready state 600, a doze state 602, a stand-by state 604, a suspend state 606, a transitory state 608. **During ready state 600, computer system 200 is considered full-on; that is, all components of the computer system 200 are clocked at full speed and are powered-on**. The power management state machine 260 enters the ready state 600 upon power-up of the computer system and upon reset. The **power management state machine 600 also enters the ready state 200 when a primary system activity is detected** or when an internal state register (non shown) of configuration registers unit 270 is written with a "ready state" value via software writing through external bus 206. The classification of certain activities as "primary" activities is described further below (A316, col. 7, lines 46-60).

Gephardt thus teaches that there are five states: ready state 600, doze

state 602, stand-by state 604, suspend state 606 and transitory state 608. Gephardt further teaches that when a "primary system activity" is detected, ready state 600 is entered and all components of the computer system 200 are clocked at full speed and powered-on. Gephardt further teaches:

> Power management **state machine 260 transitions from the ready state 600 to the doze state 602 if a primary activity is not detected during the entire duration of a first time-out period (0.125 seconds to 16 seconds) as determined by a first time-out counter within time-out counters unit 268**. The power management state machine 260 can alternatively enter doze state 602 via software writing of a "doze state" value into the state register of configuration registers unit 270. **During doze state 602, clock control unit 264 controls clock generator 230 such that the CPU clock signal is slowed down to a preprogrammed frequency**. It is noted that during doze state 602, the system clock signal continues to be driven at its maximum relative frequency, and all components are powered-on (A316, col. 7, line 61 – col. 8, line 7).

Gephardt therefore teaches that if no primary activity is detected during the ENTIRE duration of a first time-out period (0.125 seconds to 16 seconds), state machine 260 transitions from the ready state to the doze state 602, during which the CPU clock is slowed down to a preprogrammed frequency by clock control unit 264. Gephardt goes on to teach:

> The power management **state machine 260 transitions from the doze state 602 to the stand-by state 604 if the system is idle for the entire duration of a second time-out period (1**

> **minute to 16 minutes) without any primary activities occurring, as determined by a second time-out counter within time-out counters unit 268**. The power management state machine 260 can alternatively enter the stand-by state 604 via software writing to the state register of configuration registers unit 270. During the stand-by state 604, power control unit 266 may cause the power to be removed from selected circuits portions, such as peripheral device 204. In addition, **during stand-by state 604, clock control unit 264 causes the clock generator 230 to turn-off the CPU clock signal**. The system clock signal continues to be driven at its maximum relative frequency (A316, col. 8, lines 8-22).

Gephardt thus teaches that if no primary activity is detected during the ENTIRE duration of a SECOND time-out period (1 minute to 16 minutes), state machine 260 transitions from the doze state 602 to the stand-by 604, during which the CPU clock is turned-off by clock generator 230. Gephardt further teaches:

> The power management **state machine 260 transitions to the suspend state 606 from the stand-by state 604 if the system is idle for the entire duration of a third time-out period (5 minutes to 60 minutes) without any primary activities occurring**, as determined by a third time-out counter within time-out counters unit 268. Power management state machine 260 may alternatively enter the suspend state via software writing of a "suspend state" value into the state register of configuration registers unit 270. **When power management state machine 260 is in the suspend state 606**, power control unit 266 may cause the power to be removed from selected circuit portion, such as peripheral device 244, and **clock control unit 264 causes clock generator 230 to stop both the CPU clock signal and the system clock signal**. Depending upon the system, the power control unit 252 may further cause

power to be removed from additional circuit portions (A316, col. 8, lines 23-39).

Gephardt thus teaches that if no primary activity is detected during the ENTIRE duration of a THIRD time-out period (5 minutes to 60 minutes), state machine 260 transitions from the stand-by state 604 to the suspend state 606, during which both the CPU clock and the system clock are stopped. Gephardt goes on, however, to teach:

> Power management **state machine 260 enters the transitory state 608 from either the doze state 602 or stand-by state 604 if a secondary activity is detected**, as will be described in greater detail below. Depending upon the detected secondary activity, the power management state machine 260 remains in the transitory state 608 for a predetermined time following detection of the secondary activity or for a pre determined amount of time following completion of the secondary activity. **During transitory state 608, power management state machine 260 causes clock control unit 264 to control clock generator such that the CPU clock signal and the system clock signal are driven at their MAXIMUM RELATIVE FREQUENCIES**. Power if further applied to all circuit portions. **Following the predetermined amount of time, power management state machine 260 reverts back to the previous state** (i.e., doze state 602 or stand-by state 604)(A316, col. 8, lines 44-55).

Gephardt therefore teaches that if "secondary activity" is detected during doze state 602 or stand-by state 604, state machine 260 enters transitory state 608 during which the CPU clock signal and the system clock signal are DRIVEN AT THEIR MAXIMUM RELATIVE FREQUENCIES.

The only significant difference in the way Gephardt's system handles "primary" and "secondary" activities is the amount of time the system takes to return to the previous doze state or stand-by state. In the case of a "primary" activity, Gephardt's state machine 260 will again wait for the entire duration of a first time-out period (0.125 seconds to 16 seconds), before transitioning to the doze state. If previously in a stand-by state, in addition to waiting for a first time-out period, Gephardt will additionally wait for the entire duration of a second time-out period (1 minute to 16 minutes). In contrast, in the case of a "secondary" activity, Gephardt's system will revert back to either the previous state (i.e., doze state 602 or stand-by state 604) following the predetermined amount of time.

Contrary to the determination of the Board, Gephardt's "primary activities" are not the equivalent of Appellant's "critical I/O". Even if, arguendo, Gephardt's "primary activities" could be considered the equivalent of Appellant's "critical I/O", Gephardt makes it very clear that both "primary" and "secondary" activities are processed at full clock speed. Further, there is no teaching in Gephardt that the CPU clock speed can be slowed or stopped while processing "secondary activity". Accordingly, the Board committed error in its determination of the teaching of Gephardt and

in combining it with Hollowell and Kikinis and determining that the combination of the three references teaches all the limitations of Claims 5, 6 and 9.

As mentioned previously, in proceedings before the Patent and Trademark Office, "the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art". In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (citing In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). "The Examiner can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references", In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992)(citing In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)(citing In re Lalu, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)). The Examiner has not met this burden in the present case. The Examiner has not provided any evidence of knowledge generally available to one of ordinary skill in the art at the time of the invention that would lead that individual to combine the relevant teachings of the Kikinis, Hollowell and Gephardt references. Moreover, even if there were such teaching, the Examiner

provides no teaching or suggestion, without the improper hindsight provided by Appellant's disclosure, for the additional modifications that would be required by any combination device in order for it to be able to obviate the claimed invention.

Even if the cited art were to disclose components of the device in issue, case law holds that it is insufficient that the prior art discloses the components of the device in issue, either separately or used in other combination; there must be some teaching, suggestion, or incentive to make the combination made by the inventor. Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934, 15 USPQ2d 1321, 1323 (Fed. Cir. 1990). Moreover, "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under section 103, teachings of references can be combined ONLY if there is some suggestion or incentive to do so." ACS Hosp. Systems, Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). The Examiner in the present case has not provided any teaching or suggestion from the art supporting the combination.

Moreover, the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Laskowski, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). Simply put, the prior art does not teach or suggest the modifications necessary to attain Appellant's claimed invention. Accordingly, the Examiner has improperly used hindsight and Appellant's disclosure to obviate his claimed invention. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985). Moreover, "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). The 35 U.S.C. § 103 rejection is overcome. Just because something is desirable (especially in hindsight) does not mean it is obvious.

2) The PTO did not establish a prima facie case of obviousness of Claims 17, 18 and 21, and through claim dependency, Claims 19, 20 and 23, over Hollowell in view of Kikinis and Chen under 35 U.S.C. § 103(a), as required by law.

Independent claim 17 requires and positively recites, "**means for sampling a temperature level** associated with the operation of a central processing unit within said computer", "**means for predicting temperature levels associated with the operation of said central processing unit within said computer**" and "**means for using said prediction for automatic control of temperature within said computer, said temperature control remaining transparent to a user of said computer**".

Independent Claim 18 requires and positively recites, "**means for sampling a temperature level** associated with the operation of said computer", "**means for predicting temperature levels associated with the operation of said computer**" and "**means for using said prediction for automatic temperature control within said computer, said temperature control remaining transparent to a user of said computer**".

Independent Claim 21 requires and positively recites, "a central

processing unit (CPU)", "**means for sampling a temperature level** within said apparatus" and "**means for automatically adjusting the processing speed of said central processing unit (CPU) by modifying the clock signal utilized by the central processing unit (CPU) to maintain said temperature level within said apparatus below a selected reference temperature level when said CPU is not processing critical I/O**".

A. The Board specifically determined that in the proposed combination, Hollowell and Kikinis's actual temperature measurements were REPLACED with Chen's predicted temperature.

The Board made the following determination:

> In our view, the question here is whether it would have been obvious to the artisan **to replace** the actual temperature measurements of Hollowell or Kikinis with predicted temperature measurements as taught by Chen (A10, lines17-20).

As determined by the Board, the resulting combination of Hollowell, Kikinis and Chen would result in an apparatus having no actual temperature measurement, relying instead solely on temperature prediction. In contrast, Claims 17 and 18 both require actual temperature measurement (i.e., means

for sampling a temperature) and means for predicting temperature. Webster's II New Riverside University Dictionary (1984) defines the term "sample" as:

> 1. a. A part representative of a whole. B. An entity representative of a class: SPECIMEN. 2. Statistics. A set of elements drawn from and analyzed to estimate the characteristics of a population (ADDENDUM-3).

Moreover, Appellant's use of the term "sampling" in the specification clearly implies an actual temperature measurement (A32, lines 3-12) – NOT an estimate of temperature. Accordingly, the combination of Hollowell, Kikinis and Chen, as defined by the Board, does not teach or suggest, "**means for sampling a temperature level** associated with the operation of a central processing unit within said computer", as required by Claim 17, or "**means for sampling a temperature level** associated with the operation of said computer", as required by Claim 18, or "**means for sampling a temperature level** within said apparatus", as required by Claim 21. Each of these claims requires both a means for sampling (i.e., measuring) temperature and a means for predicting temperature (such combination supported in the specification, A37, lines 5-6).

Appellant further disputes the Board's determination:

Thus, temperature in Chen is indirectly measured (A11, lines 2-3).

Appellant respectfully responds that Chen does not "indirectly measure" anything. Chen does not disclose any circuitry for indirect "measurement" of the processor or apparatus at issue. Chen discloses estimation of temperature based upon models of actual temperature change measurements of a previous microprocessor operating at low and high speeds which was previously recorded in a digital format in storage registers (A320, ABSTRACT, lines 1-6).

In light of the above misunderstanding/misapplication of the teaching of Chen, one having ordinary skill in the art would not have been motivated to combine the Hollowell, Kikinis and Chen references in any manner that would have obviated the invention of Claims 17, 18 and 21. Accordingly, the Board's determination that Claims 17, 18, 21 (and their dependent claims) are obvious under 35 U.S.C. 103(a) over Hollowell in view of Kikinis and Chen is erroneous and should be reversed.

The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the

prior art suggested the desirability of the modification. In re Laskowski, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). Simply put, the prior art does not teach or suggest the modifications necessary to attain Appellant's claimed invention. Accordingly, the Board has improperly used hindsight and Appellant's disclosure to obviate his claimed invention. It is also impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985). Moreover, "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

B. The Chen reference is not relevant to Claim 21 and was erroneously relied upon by the Board (in combination with Hollowell and Kikinis) to obviate Claim 21.

Independent Claim 21 requires and positively recites, "a central

processing unit (CPU)", "**means for sampling a temperature level** within said apparatus" and "means for automatically adjusting the processing speed of said central processing unit (CPU) by modifying the clock signal utilized by the central processing unit (CPU) to maintain said temperature level within said apparatus below a selected reference temperature level **when said CPU is not processing critical I/O**".

The Board stated the following regarding the Examiner's determination regarding Hollowell and Kikinis:

> The examiner finds that the combination of Hollowell and Kikinis meets the claimed invention **except for the claimed feature of not stopping the clock signal when the CPU is processing critical I/O** (A6, lines 5-8).

Appellant respectfully responds that Claim 21, unlike Claims 17 and 18, contains the above-identified feature, which the Examiner admits is missing from the Hollowell and Kikinis combination.

The Board made the following further determination:

> In our view, the question here is whether it would have been obvious to the artisan **to replace** the actual temperature measurements of Hollowell or Kikinis with predicted temperature measurements as taught by Chen (A10, lines17-20).

As determined by the Board, the resulting combination of Hollowell, Kikinis and Chen would result in an apparatus having no actual temperature measurement, relying instead solely on temperature prediction. In contrast, Claim 21 requires actual temperature measurement (i.e., means for sampling a temperature) – there is NO temperature prediction. Webster's II New Riverside University Dictionary (1984) defines the term "sample" as:

> 1. a. A part representative of a whole. B. An entity representative of a class: SPECIMEN. 2. Statistics. A set of elements drawn from and analyzed to estimate the characteristics of a population (ADDENDUM-3).

Moreover, Appellant's use of the term "sampling" in the specification clearly implies an actual temperature measurement (A32, lines 3-12) – NOT an estimate of temperature. Accordingly, the combination of Hollowell, Kikinis and Chen, as defined by the Board, does not teach or suggest, "**means for sampling a temperature level** within said apparatus" and "means for automatically adjusting the processing speed of said central processing unit (CPU) by modifying the clock signal utilized by the central processing unit (CPU) to maintain said temperature level within said apparatus below a selected reference temperature level **when said CPU is not processing critical I/O**" as required by Claim 21.

Since the PTO has admitted that a combination of Hollowell and Kikinis **does not teach the claimed feature of not stopping the clock signal when the CPU is processing critical I/O** (Decision, page 6, lines 6-8), and being that Chen is not applicable to Claim 21 since it deals exclusively with temperature estimation – versus Claim 21's requirement of actual temperature level measurement – the combination of Hollowell, Kikinis and Chen fail to teach or suggest all of the limitations required by Claim 21. Accordingly, the Board's determination that Claim 21 (and dependent Claim 23) are obvious under 35 U.S.C. § 103(a) over Hollowell in view of Kikinis and Chen is erroneous and should be reversed.

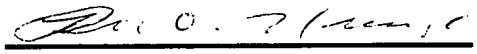
As stated previously, the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Laskowski, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). Simply put, the prior art does not teach or suggest the modifications necessary to attain Appellant's claimed invention. Accordingly, the Board has improperly used hindsight and Appellant's disclosure to obviate his claimed invention. It is also

impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985). Moreover, "One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

CONCLUSION

For the foregoing reasons, this Court should reverse the Decision of the Board holding Claims 2, 3, 5, 6, 9, 17-21, 23, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73, obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103.

Respectfully submitted,



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ADDENDUM

WEBSTER'S II
New Riverside University Dictionary

All correspondence and inquiries should be directed to
Reference Division, Houghton Mifflin Company
One Beacon Street, Boston, MA 02108

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salt rheum *n.* Eczema.

salt·shak·er (sôlt'shā'kər) *n.* A container with a perforated top for sprinkling table salt.

salt·wa·ter (sôlt'wô'tər, -wŏt'ər) *adj.* Relating to, consisting of, or inhabiting salt water.

salt·works (sôlt'wûrks') *pl.n. (used with a sing. or pl. verb).* A place where salt is manufactured commercially.

salt·wort (sôlt'wûrt', -wôrt') *n.* An Old World plant of the genus *Salsola*, esp. *S. kali*, having stiff prickly leaves and growing on sandy seashores.

salt·y (sôl'tē) *adj.* **-i·er, -i·est. 1.** Of, containing, or seasoned with salt. **2.** Suggestive of the sea or sailing life. **3. a.** Witty : piquant. **b.** EARTHY 3. **—salt'i·ly** *adv.* **—salt'i·ness** *n.*

sa·lu·bri·ous (sə-lōō'brē-əs) *adj.* [< Lat. *salubris* < *salus*, health.] Conducive or favorable to health or well-being. **—sa·lu'bri·ous·ly** *adv.* **—sa·lu'bri·ous·ness, sa·lu'bri·ty** (-brĭ-tē) *n.*

sa·lu·ki (sə-lōō'kē) *n.* [Ar. *salūqīy*, of Saluq, an ancient Arabian city.] A tall, slender dog orig. bred in Arabia and Egypt, with a smooth, silky, variously colored coat.

sal·u·tar·y (săl'yə-tĕr'ē) *adj.* [OFr. *salutaire* < Lat. *salutaris* < *salus*, health.] **1.** Effecting or designed to effect an improvement : REMEDIAL <*salutary* advice> **2.** Promoting health : WHOLESOME <a *salutary* diet> **—sal'u·tar'i·ly** (-târ'ə-lē) *adv.* **—sal'u·tar'i·ness** *n.*

sal·u·ta·tion (săl'yə-tā'shən) *n.* **1.** An expression of greeting or good will. **2.** A gesture of greeting, as a bow or kiss. **3.** A word or phrase of greeting, as *Dear Sir* in a letter.

sa·lu·ta·to·ri·an (sə-lōō'tə-tôr'ē-ən, -tōr'-) *n.* The student who delivers the salutatory at graduation exercises, usu. the one who ranks second in the class.

sa·lu·ta·to·ry (sə-lōō'tə-tôr'ē, -tōr'ē) *n., pl.* **-ries.** An opening or welcoming address. —*adj.* Of or expressing a salutation.

sa·lute (sə-lōōt') *v.* **-lut·ed, -lut·ing, -lutes.** [ME *saluten* < Lat. *salutare* < *salus*, health.] —*vt.* **1.** To greet or address with an expression of welcome, good will, or respect. **2.** To recognize (a military superior) with a prescribed gesture, as by raising the hand to the forehead or cap. **3.** To honor formally and ceremoniously. **4.** To come forth as if to greet. —*vi.* To make a gesture of greeting or respect. —*n.* **1.** An act or gesture of welcome, honor, or courteous recognition. **2.** A formal military display of honor or greeting, as the firing of cannon. **—sa·lut'er** *n.*

sal·va·ble (săl'və-bəl) *adj.* [< LLat. *salvare*, to save < Lat. *salvus*, safe.] Capable of being saved or salvaged.

Sal·va·do·ran (săl'və-dôr'ē-ən, -dōr'-) *also* **Sal·va·do·ran** (-dôr'ən, -dōr'-) *n.* A native or resident of El Salvador. **—Sal'va·do'ri·an** *adj.*

sal·vage (săl'vĭj) *n.* [< Fr., act of saving < OFr. *salver*, to save < LLat. *salvare* < Lat. *salvus*, safe.] **1. a.** The rescue of a ship, its crew, or its cargo, as from fire or shipwreck. **b.** The ship, crew, or cargo so rescued. **c.** Compensation given to those who voluntarily aid in such a rescue. **2. a.** The act of saving imperiled property from loss. **b.** The property so saved. —*vt.* **-vaged, -vag·ing, -vag·es. 1.** To save from loss or destruction. **2.** To save (damaged or discarded material) for further use. **—sal'vage·a·ble** *adj.* **—sal'vag·er** *n.*

sal·var·san (săl'vər-sən') *n.* [G.; orig. a trademark.] Arsphenamine.

sal·va·tion (săl-vā'shən) *n.* [ME < OFr. < LLat. *salvatio* < *salvare*, to save < Lat. *salvus*, safe.] **1. a.** Preservation or deliverance from danger, evil, or difficulty. **b.** A source, means, or cause of such salvation. **2. a.** Deliverance from the power or penalty of sin : REDEMPTION. **b.** *Christian Science.* The realization and demonstration of Life, Truth, and Love as supreme over all, carrying with it the destruction of the illusions of sin, sickness, and death. **—sal·va'tion·al** *adj.*

Salvation Army *n.* An international evangelical and charitable organization founded in England in 1865 by William Booth.

sal·va·tion·ist (săl-vā'shə-nĭst) *n.* **1.** *often* **Salvationist.** A member of the Salvation Army. **2.** An evangelist.

salve[1] (săv, säv) *n.* [ME < OE *sealf.*] **1.** An analgesic or medicinal ointment, as for burns or sores. **2.** A soothing or healing agent : BALM. **3.** Flattery or commendation. —*vt.* **salved, salv·ing, salves.** To heal or soothe with or as if with salve.

salve[2] (sălv) *vt.* **salved, salv·ing, salves.** [Back-formation < SALVAGE.] To salvage. **—sal'vor** *n.*

sal·ver (săl'vər) *n.* [Alteration of Fr. *salve* < Sp. *salva*, tasting of food to detect poison < *salvar*, to save, taste food to detect poison < LLat. *salvare*, to save < Lat. *salvus*, safe.] A tray for serving food or drinks.

sal·vi·a (săl'vē-ə) *n.* [NLat. *Salvia*, genus name < Lat. *salvia*, sage. —see SAGE[2].] A plant or shrub of the genus *Salvia*, cultivated for its blue or bright red flowers.

sal·vo (săl'vō) *n., pl.* **-vos** *or* **-voes.** [Ital. *salva*, salute < Lat. *salve*, hail, imper. of *salvēre*, to be in good health < *salvus*, safe.] **1. a.** A simultaneous discharge of firearms. **b.** The release of a rack of bombs from an aircraft. **c.** The projectiles or bombs thus released. **2.** A sudden outburst of cheers or applause. **3.** A salute : tribute.

sal volatile (vō-lăt'ə-lē) *n.* [NLat., volatile salt.] A solution of ammonium carbonate in alcohol or ammonia water.

sam·a·ra (săm'ər-ə, sə-măr'ə, -mär'ə) *n.* [Lat., elm seed.] A winged, indehiscent, usu. one-seeded fruit, as of the ash or maple.

Sa·mar·i·tan (sə-măr'ĭ-tn, -mär'-) *n.* [ME < LLat. *Samaritanus* < Gk. *Samaritēs* < *Samareia*, Samaria.] **1.** A native or resident of Samaria. **2.** A Good Samaritan. —*adj.* Of or relating to Samaria or to Samaritans.

sa·mar·i·um (sə-măr'ē-əm, -mär'-) *n.* [SAMAR(SKITE) + -IUM.] *Symbol* **Sm** A silvery or pale-gray metallic rare-earth element used in laser materials, in infrared absorbing glass, and as a neutron absorber; atomic number 62; atomic weight.

sa·mar·skite (sə-măr'skīt', săm'ər-) *n.* [Fr., after Col. von *Samarski*, 19th-cent. Russian mine official.] A velvet-black mineral oxide with red-brown streaks, a source of several rare-earth metals.

sam·ba (săm'bə, säm'-) *n.* [Port.] **1.** An African dance modified in Brazil as a ballroom dance. **2.** Music in 4/4 time for dancing the samba. —*vi.* **-baed, -ba·ing, -bas.** To dance the samba.

sam·bar *also* **sam·bur** (săm'bər, säm'-) *n.* [Hindi *sāmbar* < Skt. *śambaṭgh.*] A large deer, *Cervus unicolor* of southeastern Asia, with a reddish-brown coat.

Sam Browne belt (săm' broun') *n.* [After Sir *Samuel* James *Browne* (1824–1901).] A belt with a shoulder strap running diagonally across the chest, worn as part of a military or police uniform.

sam·bur (săm'bər, säm'-) *n. var. of* SAMBAR.

same (sām) *adj.* [ME < ON *samr.*] **1.** Being the very one : IDENTICAL. **2.** Alike in kind, quality, quantity, or degree. **3.** Conforming in every detail <using the *same* procedures as before> **4.** Being the one previously mentioned or indicated : AFORESAID. —*adv.* In the same way. —*pron.* **1.** One identical with another. **2.** The one previously mentioned or described. ***usage:*** Only in legal contexts is *same* or *the same* used as a substitute for *it, they,* or *them.* Therefore, avoid sentences like *The charge is five dollars; please remit same.*

☆ ***syns:*** **1.** SAME, IDENTICAL, SELFSAME, VERY *adj. core meaning* : being one and not another or others <the *same* seat I had yesterday> ***ant:*** different **2.** SAME, EQUAL, EQUIVALENT, IDENTICAL *adj. core meaning* : agreeing exactly in value, quantity, or effect <the *same* rules expressed in different words> ***ant:*** different

sa·mekh (sä'mĕk') *n.* [Heb. *sāmekh.*] The 15th letter of the Hebrew alphabet. —See table at ALPHABET.

same·ness (sām'nĭs) *n.* **1.** The quality or state of being the same. **2.** Lack of variety or change : MONOTONY.

sam·i·sen (săm'ĭ-sĕn') *n.* [J. : *sami*, three + *sen*, string.] A Japanese musical instrument resembling a banjo, with a long neck and three strings played with a plectrum.

sam·ite (săm'īt', sā'mīt') *n.* [ME *samit* < OFr. < Med. Lat. *examitum* < Med. Gk. *hexamiton* < Gk. *hexamitos*, of six threads : *hexa-*, six + *mitos*, warp thread.] A heavy silk fabric, frequently interwoven with gold or silver, worn in the Middle Ages.

sa·miz·dat (sä'mĕz-dät') *n.* [R. : *sam*, self + *izdatel'stvo*, publisher < *izdat'*, to publish.] **1. a.** Secret publication and distribution of government-banned literature in the U.S.S.R. **b.** The literature produced by this system. **2.** An underground press.

sam·let (săm'lĭt) *n.* [Blend of SALMON + -LET.] A young salmon.

Sa·mo·an (sə-mō'ən) *adj.* Of or relating to Samoa, its Polynesian people, or their language. —*n.* **1.** A native or resident of Samoa. **2.** The Polynesian language of Samoa.

sam·o·var (săm'ə-vär') *n.* [R. : *samo-*, self + *varit'*, to boil.] A metal urn with a spigot, used esp. in Russia to boil water for tea.

Sam·o·yed *also* **Sam·o·yede** (săm'ə-yĕd', -oi-ĕd') *n.* [R. *samoed* < Lapp *Sámе-Áednáma*, of Lapland.] **1.** A member of a Ural-Altaic people inhabiting the tundra lands of the northeastern European Soviet Union and northwestern Siberia. **2.** A branch of the Uralic language family that comprises the languages of the Samoyeds. **3.** A dog orig. bred in northern Eurasia, with a thick, long white coat. **—Sam'o·yed'ic** (-yĕd'ĭk) *adj.*

samp (sămp) *n.* [Narraganset *nasdump*, corn mush.] A coarse hominy or a porridge made from it.

sam·pan (săm'păn') *n.* [Chin. *san*[1] *ban*[3] : *san*[1], small + *ban*[3], board.] A flat-bottomed Oriental skiff propelled usu. by two oars.

sam·phire (săm'fīr') *n.* [Alteration of OFr. (*herbe de*) *Saint Pierre*, (herb of) St. Peter.] **1.** The glasswort. **2.** An Old World plant of coastal areas, esp. *Crithmium maritimum*, with fleshy divided leaves and small white or yellowish flowers.

sam·ple (săm'pəl) *n.* [ME < OFr. *essample.* —see EXAMPLE.] **1. a.** A part representative of a whole. **b.** An entity representative of a class : SPECIMEN. **2.** *Statistics.* A set of elements drawn from and analyzed to estimate the characteristics of a population. —*vt.* **-pled, -pling, -ples.** To take a sample of, esp. to test or examine by a sample.

sam·pler (săm'plər) *n.* **1.** One employed to take and appraise samples, as of a food product. **2.** A mechanical device for obtaining and analyzing samples. **3.** A piece of cloth embroidered with designs or mottoes in various stitches.

sam·pling (săm'plĭng) *n.* **1.** SAMPLE 2. **2.** The act or process of selecting a sample.

sampling circuit *n.* A circuit that yields an output suitable for use as an error or negative signal in a controller program that uses sampling action.

RON

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAVAUGHN F. WATTS, JR.

Appeal No. 2000-0434
Application 08/568,904

TC 20567

REQ RECONSIDER 9/30/02
APPEAL CAFC 10/30/02

ON BRIEF

Before JERRY SMITH, BARRETT and GROSS, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 2, 3, 5, 6, 9, 17-21, 23, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73, which constitute all the claims remaining in the application.

The disclosed invention pertains to an apparatus for controlling the frequency of clock signals operating a computer to keep the temperature of the computer within an appropriate operating range.

Representative claim 5 is reproduced as follows:

5. An apparatus, comprising:

a provision for user input;

a provision for output;

a central processing unit (CPU) coupled to said user input and output;

a monitor for monitoring temperature within said apparatus; and

a clock manager adapted to receive a control signal from said monitor, said clock manager selectively stopping clock signals from being sent to said central processing unit (CPU) when said monitored temperature rises to a level at and above a selected reference temperature level and said CPU is not processing critical I/O.

The examiner relies on the following references:

Chen et al. (Chen)	5,422,806	June 06, 1995
Gephardt et al. (Gephardt)	5,493,684	Feb. 20, 1996 (filed Apr. 06, 1994)
Kikinis	5,502,838	Mar. 26, 1996 (filed Apr. 28, 1994)
Hollowell et al. (Hollowell)	5,590,061	Dec. 31, 1996 (filed May 12, 1994)

Claims 2, 3, 5, 6, 9, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Hollowell in view of Kikinis and Gephardt. Claims 17-21 and 23 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teachings of Hollowell in view of Kikinis and Chen.

Rather than repeat the arguments of appellant or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in

the art the obviousness of the invention as set forth in each of the claims on appeal. Accordingly, we affirm.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness.

Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by appellant have been considered in this decision. Arguments which appellant could have made but chose not to make in the brief have not been considered and are deemed to be waived by appellant [see 37 CFR § 1.192(a)].

We consider first the rejection based on Hollowell, Kikinis and Gephardt. The examiner cites Hollowell as teaching a thermal control system for controlling the power applied to a computer. The system of Hollowell stops the application of power supplied to the CPU when the monitored temperature of the CPU exceeds a threshold value rather than adjusting the frequency of clock signals supplied to the CPU. The examiner cites Kikinis as teaching a thermal control system for an integrated circuit in which the system adjusts the frequency of clock signals supplied

to components to maintain the temperature of the components within a desirable operating range. The examiner finds that it would have been obvious to the artisan to maintain thermal control in Hollowell by adjusting the frequency of clock signals as taught by Kikinis. The examiner finds that the combination of Hollowell and Kikinis meets the claimed invention except for the claimed feature of not stopping the clock signals when the CPU is processing critical I/O. The examiner cites Gephardt as teaching a power management system for a computer in which clock frequencies are controlled based on the type of activity performed by the computer. The examiner finds that it would have been obvious to the artisan to stop the clock of the Hollowell-Kikinis combination only when the CPU is not processing critical I/O to prevent losing vital information [answer, pages 3-5].

With respect to each of the independent claims, appellant argues that Gephardt fails to teach or suggest any means for detecting critical activity. Appellant points to the background of the invention in Gephardt in which Gephardt notes that prior art systems did not treat detected activities differently. Appellant also asserts that frequency control in Gephardt is based on a level of activity and not on temperature as claimed. Appellant then cites case law and makes the general conclusion

that the applied prior art does not teach or suggest the claimed invention [brief, pages 7-11].

The examiner responds that the disclosure in Gephardt of primary and secondary activities teaches the detection of a "critical activity." The examiner notes that Gephardt was not relied on for teaching power control responsive to temperature measurements. The examiner notes that Gephardt was cited only to show that there are critical activities during which power to the computer cannot be stopped [answer, pages 9-10].

Appellant responds that there is no mention of "critical activity" in Gephardt [reply brief].

We will sustain the examiner's rejection with respect to independent claims 5, 6 and 9. We first note that we agree with the propriety of the examiner's combination of the applied prior art. Hollowell and Kikinis both relate to the control of heat generation within a computer in order to maintain the temperature within a desirable operating range. These two references also teach that heat control can be achieved by either power control or clock frequency control. We agree with the examiner that it would have been obvious to the artisan to replace the power control of Hollowell with the frequency control of Kikinis to

maintain the temperature of the computer within the desirable operating range.

We also agree with the examiner that the designation of activities in Gephardt as primary activities and secondary activities discloses that some activities are considered to be more critical than other activities. The primary activities of Gephardt clearly correspond to the critical activity of the claimed invention. Gephardt discloses that primary activities cause the computer to enter the ready state regardless of its current state [column 3, lines 22-24]. Therefore, the computer cannot be shut down when a primary activity is occurring. Gephardt also discloses that the primary activities include the various I/O activities such as parallel port activities, serial port activities, floppy disk activities and hard disk activities [column 9, lines 27-31]. Therefore, Gephardt teaches that a computer should not be shut down while these primary (critical) I/O activities are taking place. We agree with the examiner that it would have been obvious to the artisan to modify the Hollowell-Kikinis combination to take into account the critical I/O activities which are taking place as taught by Gephardt.

With respect to the dependent claims, we note that appellant purports to have argued each of the dependent claims separately. Appellant's arguments with respect to the dependent claims are either to make a broad general statement that the applied prior art does not suggest the dependent claim in combination with the claim from which it depends, or to make a broad general statement that the applied prior art does not teach or suggest the limitations of the dependent claim with no supporting rationale or analysis. In our view, the examiner's rejection is sufficient to establish a prima facie case of obviousness [answer, pages 3-7]. Neither of the two types of appellant's arguments noted above constitutes a persuasive argument that the rejection is in error. In other words, appellant's arguments with respect to each of the dependent claims do not overcome the examiner's prima facie case of obviousness.

For the reasons discussed above, we sustain the examiner's rejection of all claims based on Hollowell, Kikinis and Gephardt.

We now consider the rejection based on Hollowell, Kikinis and Chen. Hollowell and Kikinis have been discussed above. The examiner notes that Hollowell and Kikinis do not teach predicting

activity and temperature levels within a computer. The examiner cites Chen as teaching that it was known to predict activity levels within a computer and use these predictions for automatic control. The examiner finds that it would have been obvious to the artisan to control the temperature in the Hollowell-Kikinis combination based on predicted activity as taught by Chen [answer, pages 7-8].

Appellant argues that no temperature measurements are needed or made in Chen. Appellant also repeats many of the arguments that were considered above [brief, pages 17-20].

The examiner responds that the predictive control in Chen controls the temperature within the computer based on a selected model of computer operation [answer, pages 10-11]. Appellant responds by repeating the arguments made in the brief [reply brief].

We will sustain the examiner's rejection of claims 17-21 and 23. In our view, the question here is whether it would have been obvious to the artisan to replace the actual temperature measurements of Hollowell or Kikinis with predicted temperature measurements as taught by Chen. Appellant is correct that Chen does not directly measure temperature, but instead, Chen measures parameters which are directly related to temperature. In other

words the measurement of time and frequency in Chen can be used to compute an estimated temperature. Thus, temperature in Chen is indirectly measured. Kikinis notes that a measurement of temperature can be made by directly sensing temperature or by measuring a parameter which is related to temperature [column 3, lines 19-41]. We find that it would have been obvious to the artisan to measure the temperature in Hollowell or Kikinis using an indirect measurement as taught by Kikinis. We agree with the examiner that it would have been obvious to the artisan to control temperature in the Hollowell-Kikinis combination using a predictive measure of temperature as taught by Chen. Therefore, we sustain the rejection of claims 17-21 and 23.

In summary, we have sustained each of the examiner's rejections of the claims on appeal. Therefore, the decision of the examiner rejecting claims 2, 3, 5, 6, 9, 17-21, 23, 30, 31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

Jerry Smith
JERRY SMITH
Administrative Patent Judge)

Lee E. Barrett
DEE E. BARRETT
Administrative Patent Judge) BOARD OF PATENT APPEALS AND INTERFERENCES

Anita Pellman Gross
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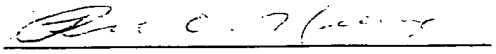
CERTIFICATE OF COMPLIANCE UNDER FED. R. APP.P. 32(A)(7)

I certify under Fed. R. App. P. 32(a)(7) that this brief is proportionately spaced, has a typeface of 14 points, and contains 11,282 words according to the word count of the word-processing system used to prepare this brief.



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CERTIFICATE OF SERVICE

I hereby certify that on February 21, 2003, I caused a copy of the foregoing BRIEF FOR APPELLANT to be delivered by the United States Postal Service Mail to:

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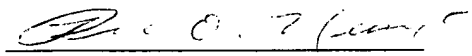

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